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| <b>TRANSMITTAL FORM</b><br><br>(to be used for all correspondence after initial filing) | Application Number   | 09/855,694-Conf. #9209 |                |
|   | Filing Date          | May 16, 2001           |                |
|   | First Named Inventor | Yong-In Park           |                |
|   | Art Unit             | 2823                   |                |
|   | Examiner Name        | J. J. Maldonado        |                |
| Total Number of Pages in This Submission  | 1                    | Attorney Docket Number | 8733.428.00-US |

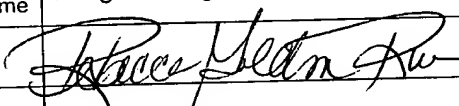
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**ENCLOSURES (Check all that apply)**

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| <input type="checkbox"/> Fee Transmittal Form<br><input type="checkbox"/> Fee Attached<br><input type="checkbox"/> Amendment/Reply<br><input type="checkbox"/> After Final<br><input type="checkbox"/> Affidavits/declaration(s)<br><input type="checkbox"/> Extension of Time Request<br><input type="checkbox"/> Express Abandonment Request<br><input type="checkbox"/> Information Disclosure Statement<br><input type="checkbox"/> Certified Copy of Priority Document(s)<br><input type="checkbox"/> Response to Missing Parts/Incomplete Application<br><input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53 | <input type="checkbox"/> Drawing(s)<br><input type="checkbox"/> Licensing-related Papers<br><input type="checkbox"/> Petition<br><input type="checkbox"/> Petition to Convert to a Provisional Application<br><input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address<br><input type="checkbox"/> Terminal Disclaimer<br><input type="checkbox"/> Request for Refund<br><input type="checkbox"/> CD, Number of CD(s) _____ | <input type="checkbox"/> After Allowance Communication to Group<br><input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences<br><input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)<br><input type="checkbox"/> Proprietary Information<br><input type="checkbox"/> Status Letter<br><input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):<br>Reply Brief (in triplicate; 12 pages) |
| <div>Remarks</div>  |  |  |

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

|                         |   |
|-------------------------|---|
| Firm or Individual name | MCKENNA LONG & ALDRIDGE LLP<br>Song K. Jung   |
| Signature               |  Reg No 41,786 |
| Date                    | March 1, 2004   |



Docket No.: 8733.428.00-US  
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:  
Young-In PARK

Application No.: 09/855,694

Filed: May 16, 2001

For: METHOD OF MANUFACTURING A THIN  
FILM TRANSISTOR AND  
MANUFACTURING EQUIPMENT

Customer No.: 30827

Group Art Unit: 2823

Examiner: Julio J. Maldonado

Confirmation No.: 9209

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**REPLY BRIEF**

**Attention: Board of Patent Appeals and Interferences**  
Honorable Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to the Examiner's Answer mailed December 30, 2003, Appellant submits the following Reply Brief in the above-identified application (transmitted in triplicate):

**ARGUMENTS**

Further to the arguments made in the Appeal Brief filed on October 3, 2003 and in reply to the Examiner's Answer dated December 30, 2003, Appellant asserts a *prima facie* case of obviousness has not been established and all pending claims are in condition for allowance.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable

expectation of success must both be found in the prior art, and not based on Appellant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In the Examiner's Answer dated December 30, 2003, the Examiner reiterates that "the prior art fails to teach transferring the first substrate having the organic layer from a first chamber to a second chamber without exposing the first substrate having the organic layer to oxygen atmosphere during transfer." Examiner's Answer, p. 4. Appellant concurs with this assessment. However, Appellant does not agree with the Examiner's continued citation of the third embodiment of Yamazaki in combination with the Related Art disclosed by the present application as rendering the claims on appeal obvious.

Specifically, the Examiner cites to Yamazaki Figures 5, 13 and 14. The embodiments of these figures, as well as the other embodiments disclosed in Yamazaki, do not address the problems related to forming a semiconductor layer over an inorganic gate insulating layer of the Related Art. That is, "when a gate insulating layer is silicon nitride (SiNx), a parasitic capacitance 'C' is present between the gate electrode and the source electrode, and between the gate electrode and the drain electrode." Specification at p. 6, lines 1-4. Moreover, so that the gate electrode has lower resistance, "a thick gate electrode (gate line) is preferred over a wide one. However, a thick gate electrode (gate line) may cause a break in the gate-insulating layer." Specification at p. 6, lines 9-11.

Yamazaki fails to address the deficiencies of a silicon nitride (SiNx) gate-insulating layer. In fact, as discussed in detail below, the embodiments of Yamazaki either fail to teach an organic insulating layer as a true first insulating layer or tellingly include a base layer SiNx before a first insulating film. In this manner, Yamazaki cannot cure the parasitic capacitance problems and SiNx layer breakage problems of the Related Art.

In addition, as discussed with respect to Related Art Figure 4, there are problems related to forming a Benzocyclobutene (BCB) gate-insulating layer, as discussed in detail at pages 6-7 of the present specification. Yamazaki does not address these problems because Yamazaki does not address any processing associated with an organic layer. For example, in the only embodiment of Yamazaki that even mentions a BCB layer (which is provided above an

inorganic base layer), there is tellingly no discussion of how that BCB layer is formed or even in which chamber such a layer is formed. Yamazaki, Col. 15, line 3 to Col. 16, line 35.

In view of the problems of the Related Art and the failure of Yamazaki to address these problems, Appellant respectfully submits that there could be no motivation to combine Yamazaki and the Related Art, with its clear disadvantages, to arrive at the present invention.

By way of example, the first and second embodiments of Yamazaki disclose an inorganic gate insulating film 103, for example, a "silicon nitride oxide ( $\text{SiO}_x\text{N}_y$ ) film" (col. 9, lines 56-59). After the gate insulating film 103 is deposited, an initial semiconductor film 104 which "may be an amorphous silicon film, an amorphous semiconductor film containing microcrystals, a microcrystalline semiconductor film, an amorphous germanium film, an amorphous silicon germanium," is formed (see col. 10, lines 4-8). As can be seen from this exemplary disclosure, no organic insulating film is taught or suggested by these embodiments of Yamazaki. In the third embodiment of Yamazaki, a silicon oxide nitride ( $\text{SiO}_x\text{N}_y$ ) is formed as a base film 501 on the plastic substrate before the first insulating layer 503 is formed. After the first insulating film 503 is formed, a second insulating layer 504 (silicon nitride oxide film) is formed and layered between the first insulating film 503 and the initial semiconductor film (microcrystalline silicon film) (see, col. 15, lines 10-43). Therefore, Yamazaki would not solve the problem of the Related Art, as discussed above.

Accordingly, Appellant respectfully submits that one of skill in the art would not look to Yamazaki to cure the deficiencies of the Related Art. Moreover, even if the Related Art were modified by the teachings of Yamazaki, the resulting method would be different from the method recited in independent claims 1, 15 and 18 and their dependent claims 2-5, 16-17 and 19-20, respectively, of the present application.

Appellant respectfully submits the applied combination of the Related Art and Yamazaki fails to teach or suggest the combined features recited in the claims of the present application. For example, the combination of the Related Art and Yamazaki fail to teach a method that includes "depositing an organic insulating layer over the substrate having the gate electrode; . . . curing the organic insulating layer; and forming a silicon layer on the organic insulating layer in the equipment without breaking the vacuum," as recited in independent claim

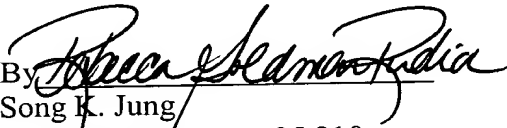
1. Furthermore, the combination of the Related Art and Yamazaki fail to teach a method that includes "forming an organic layer over the substrate having the gate electrode; curing the organic layer in a first chamber; . . . [and] forming an active layer on the organic layer in the second chamber," as recited in independent claims 15 and 18.

Because the method resulting from the combination of the Related Art and Yamazaki would be different from the method recited in claims 1, 15 and 18, a *prima facie* case of obviousness has not been established. Appellant respectfully submits that all pending claims are in condition for allowance. In view of the above arguments, Appellant respectfully requests that the Board of Patent Appeals and Interferences dismiss the Examiner's rejections and allow claims 1-5 and 15-20.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911.

Dated: March 1, 2004

Respectfully submitted,

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